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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/712,356 | 11/14/2003 | Myung-Song Jung | 1349.1333 | 1453 |

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EXAMINER

HSIEH, SHIH WEN

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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2861

DATE MAILED: 06/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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|------------------------------|--------------------------------------|------------------------------------|--|
| Office Action Summary | Application No. 10/712,356 | Applicant(s) JUNG ET AL. | |
| | Examiner Shih-wen Hsieh | Art Unit 2861 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 May 2006.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-51 is/are pending in the application.
4a) Of the above claim(s) 14-45, 47, 49 and 51 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-13, 46, 48 and 50 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 14 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Election/Restrictions

2. Applicant's election without traverse of invention I in the reply filed on May 26, 2006 is acknowledged.
3. Claims 14-45, 47, 49 and 51 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on May 26, 2006.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 7, 8, 10, 12 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Steinfield et al. (EP 1 153 749 A1).

In regard to:

Claim 1:

Steinfield et al. teach in their fig. 4:

A monolithic bubble-ink jet print head comprising:

a substrate (410) having a plurality of resistance heat emitting bodies (416) to heat ink and an ink supply opening (the place above numeral 424, which is an ink reservoir) to supply the ink from an ink cartridge (424, also please refer to fig. 3 for ink cartridge, or the ink cartridge can be seen as numeral 236 in fig. 2. Numeral 424 can also be seen as a common ink supply or ink manifold33), refer to col. 6, line 32-43;

a chamber plate (412) formed on the substrate to form a flow channel structure including a plurality of restrictors (at a location where numeral 418 and an arrow are situated) connected with the ink supply opening and a plurality of ink chambers (418) connected with the restrictors, refer to col. 6, lines 36-43; and

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a nozzle plate (306) formed on the chamber plate to have a plurality of nozzles (420) formed therethrough, wherein the nozzle plate has an anti-curing-deformation part (450) formed at at least one of an inner surface thereof forming the ink chambers and an outer surface thereof forming a front or outer surface of the printer head to prevent an abnormal deformation from being generated therein during a curing process, refer to col. 6, lines 45-56 and col. 7, line 33 to col. 8, line 26.

Claim 7:

Steinfeld et al. further teach:

wherein the anti-curing-deformation part comprises at least one groove disposed in a longitudinal direction between rows of the nozzles of the nozzle plate, refer to figs. 3 and 4. In fig. 5, Steinfeld et al. called this anti-curing-deformation part a mechanical feature (450), and is a recess (see col. 8, lines 9-26). A recess can be seen as a groove, and since fig. 4 is a view of section 4-4 of fig. 3, it is therefore oriented in the lengthwise of the nozzle arrays (not shown in nozzle 306) and a between rows of nozzles is a possible way of laying such mechanical feature.

Claim 8:

Steinfeld et al. further teach the mechanical feature (450, or the recess) is in the second shape of:

wherein the at least one groove comprises a groove formed of one of:

a shape (considered as the first shape, Examiner added) that has a wide width at a center part in the longitudinal direction of the nozzle plate and a narrow width at both edge pads in the longitudinal direction of the nozzle plate, and

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a shape (considered as **the second shape**, Examiner added) that has a same width at the center part and at the both edge parts.

Claim 10:

Steinfeld et al. further teach:

wherein the at least one groove is formed by additionally coating a negative photo resist on the nozzle plate and then performing a light exposure and a developing with respect to the negative photo resist by using a photo mask having a pattern of the groove and the nozzles, refer to col. 8, lines 21-26.

Claim 12:

Steinfeld et al. further teach:

a contact pad to apply an electrical signal to the resistance heat emitting bodies from an outer circuit, refer to col. 6, lines 1-10 and 26-30.

Claim 13:

Steinfeld et al. further teach:

a logic circuit having switching elements to increase a driving efficiency of the resistance heat emitting bodies, refer to col. 6, lines 34-36 and 48-52.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 2-6, 9, 11, 46, 48 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Steinfield et al.

In regard to:

Claim 2:

The device of Steinfield et al. DIFFERS from claim 2 in that it does not teach:
wherein the nozzle plate is formed of a negative photo resist.

Examiner takes Official Notice that in the photolithography art, which provides a photo mask with nozzle pattern and together with a Negative photo resist process subjecting to e.g., a UV light to develop into a nozzle plate, refer to MPEP 2144.03, In re Malcolm, 129 F.2d 529, 54 USPQ 235 (CCPA 1942).

Therefore it would have been an obvious matter to produce a nozzle plate through a photolithography method.

Claims 3-6:

The monolithic bubble-ink jet print head of claim 2, wherein the negative photo resist comprises a photosensitive polymer selected from a group including a resin of an epoxy group, a resin of a polyimide group, and a resin of a polyacrylate group (claim 3);

The monolithic bubble-ink jet print head of claim 1, wherein the nozzle plate is formed of a thermosetting polymer (claim 4);

The monolithic bubble-ink jet print head of claim 4, wherein the thermosetting polymer comprises one of a polymer of an epoxy group, a polymer of a polyimide group, and a polymer of a polyacrylate group (claim 5); and

The monolithic bubble-ink jet print head of claim 1, wherein the chamber plate and the nozzle plate are formed in a body using a same material (claim 6).

Rejection:

Claims 3-6 deal with materials.

Therefore it would have been obvious to a person having ordinary skill in the art at the time the invention was made select materials for one's device to be made, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use, refer to MPEP 2144.07.

Claim 9:

Steinfeld et al. further teach the mechanical feature (450) can extend as a thinned portion of the nozzle member (306) in a range in close proximity to the ink

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channel (418) and the adhesive layer 432, and can be in any geometrical arrangement, refer to col. 8, lines 15-21.

Therefore the device of Steinfield et al. DIFFERS from claim 9 in that it does not teach:

wherein the at least one groove comprises a plurality of grooves formed of one of:

a shape of which at least two grooves having a wide width at a center part in the longitudinal direction of the nozzle plate and a narrow width at both edge parts in the longitudinal direction of the nozzle plate are arranged in a row;

a shape of which at least two grooves having a same width at the center part and at both edge parts are arranged in a row;

a shape of which at least two grooves having a wide width at the center part and a narrow width at both edge parts are arranged parallel with each other in at least two rows;

a shape of which at least two grooves having a same width at the center part and at both edge parts are arranged parallel with each other in at least two rows;

a shape of which at least two grooves having a wide width at the center part and a narrow width at both edge parts are arranged to alternate with each other in at least two rows;

and

a shape of which at least two grooves having a same width at the center part and at both edge parts plate are arranged to alternate with each other in at least two rows.

Therefore it would have been obvious to a person having ordinary skill in the art at the time the invention was made to fabricate two of this mechanical features and arrange them either in series or in parallel so as to still fulfill their original design function (i.e., improving the nozzle chamber angle, NCA, problem by minimizing the deformation of the nozzle member during a curing stage), since it has been held that mere duplication (i.e. from one mechanical feature to two mechanical features) of an essential working parts (in this case, the mechanical feature) of a device (in this case, the ink jet printer head) involves only routine skill in the art, refer to MPEP 2144.04 VI B.

Claim 11:

The monolithic bubble-ink jet print head of claim 10, wherein the negative photo resist comprises one of:

a liquid photosensitive-negative photo resist selected from a group including a resin of an epoxy group, a resin of a polyimide group, and a resin of a polyacrylate group; and

a solid photosensitive-negative photo resist.

Rejection:

This claim is a selection of materials, and is rejected on the basis as set forth for claims 3-6 discussed above.

Claims 46, 48 and 50:

The monolithic bubble-ink jet print head of claim 11, wherein the solid photosensitive-negative photo resist is a dry film resist (claim 46);

The method of claim 46, wherein the dry film resist is a derivative of acrylate

Compound (claim 48); and

The method of claim 46, wherein the dry film resist is a derivative of epoxy compound (claim 50).

Rejection:

These claims are selection of materials, and are rejected on the basis as set forth for claims 3-6 discussed above.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shih-wen Hsieh whose telephone number is 571-272-2256. The examiner can normally be reached on 7:30AM -5:00PM.

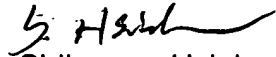
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, V. Patel can be reached on 571-272-2458. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


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SHIH-WEN HSIEH
PRIMARY EXAMINER


Shih-wen Hsieh
Primary Examiner
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SWH


June 22, 2006